AMENDMENTS TO THE CLAIMS

1.-22. (CANCEL)

23. (NEW) A radio for transmitting and receiving, via an antenna, of a plurality of high-frequency signals in a time-division-duplex mode on a single IC chip, the radio comprising:
a circuit path adapted to connect the antenna to a data output port and to a data input port, wherein the circuit path comprises:
(1) a bandpass filter for filtering signals derived from received high-frequency signals of the plurality of high-frequency signals;
(2) a discriminator for detecting a received data signal from a received filtered signal, wherein the received data signal is sent to the data output port;
(3) an up-conversion section for up-converting an information signal received from the data input port to a high-frequency signal of the plurality of high-frequency signals; and
(4) a shaping filter connected to an input of the up-conversion section;
wherein the circuit path comprising the bandpass filter, the discriminator, the up-conversion section, and the shaping filter is integrated into the single IC chip; and
wherein bandpass filtering operations are performed by components integrated into the single IC chip.

24. (NEW) The radio of claim 23, wherein the up-conversion section comprises a variable controlled oscillator.

25. (NEW) The radio of claim 23, wherein the up-conversion section comprises a directly modulated variable controlled oscillator.

26. (NEW) The radio of claim 23, wherein the radio comprises an image-rejection-mixer stage.

27. (NEW) The radio of claim 23, wherein the shaping filter comprises a Gaussian shaping filter.

28. (NEW) The radio of claim 23, further comprising a binary frequency shift keying modulation means.

29. (NEW) The radio of claim 23, further comprising automatic re-transmission request error correction means for data transfer.

30. (NEW) The radio of claim 23, further comprising continuous variable slope delta encoding means for voice transfer.

31. (NEW) The radio of claim 23, wherein the discriminator comprises a frequency modulation discriminator.

32. (NEW) The radio of claim 23, further comprising frequency hopping means for providing interference immunity.

33. (NEW) The radio of claim 23, further comprising:
autotuning means for autotuning a plurality of filters and the discriminator; and
wherein the discriminator comprises an FM discriminator.

34. (NEW) The radio of claim 23, further comprising a digital power-down control circuit to provide power-down control for the radio, wherein the power-down control circuit is integrated into the single IC chip.

35. (NEW) The radio of claim 23, further comprising a low-power oscillator integrated into the single IC chip.

36. (NEW) The radio of claim 23, wherein the signal derived from received high-frequency signals of the plurality of high-frequency signals is a low intermediate frequency signal.

37. (NEW) The radio of claim 23, wherein the circuit path further comprises a low-pass filter for filtering the received data signal output by the discriminator and the low-pass filter is connected to the discriminator and the data output port.

38. (NEW) The radio of claim 23, further comprising the antenna.

39. (NEW) A radio for transmitting and receiving, via an antenna, of a plurality of high-frequency signals in a time-division-duplex mode on a single IC chip, the radio comprising:

a circuit path adapted to connect the antenna to a data output port and to a data input port, wherein the circuit path comprises:

(1) a bandpass filter for filtering signals derived from received high-frequency signals of the plurality of high-frequency signals;

(2) a discriminator for detecting a received data signal from a received filtered signal, wherein the received data signal is sent to the data output port;

(3) an up-conversion section for up-converting an information signal received from the data input port to a high-frequency signal of the plurality of high-frequency signals;

(4) only one variable-controlled oscillator, wherein resonators are implemented for the variable-controlled oscillator without components external to the single IC chip; and

(5) a shaping filter connected to an input of the up-conversion section;

wherein the circuit path comprising the bandpass filter, the discriminator, the up-conversion section, the variable controlled oscillator, and the shaping filter is integrated into the single IC chip; and

wherein bandpass filtering operations are performed by components integrated into the single IC chip.

40. (NEW) The radio of claim 39, wherein bond-wire inductance is used to implement the resonators.

41. (NEW) The radio of claim 39, wherein the variable controlled oscillator is a directly modulated variable controlled oscillator.

42. (NEW) The radio of claim 39, wherein the radio comprises an image-rejection-mixer stage.

43. (NEW) The radio of claim 39, wherein the shaping filter comprises a Gaussian shaping filter.

44. (NEW) The radio of claim 39, further comprising a binary frequency shift keying modulation means.

45. (NEW) The radio of claim 39, further comprising automatic re-transmission request error correction means for data transfer.

46. (NEW) The radio of claim 39, further comprising continuous variable slope delta encoding means for voice transfer.

47. (NEW) The radio of claim 39, wherein the discriminator comprises a frequency modulation discriminator.

48. (NEW) The radio of claim 39, further comprising frequency hopping means for providing interference immunity.

49. (NEW) The radio of claim 39, further comprising:
autotuning means for autotuning a plurality of filters and the discriminator; and
wherein the discriminator comprises an FM discriminator.

50. (NEW) The radio of claim 39 further comprising a digital power-down control circuit to provide power-down control for the radio, wherein the power-down control circuit is integrated into the single IC chip.

51. (NEW) The radio of claim 39, further comprising a low-power oscillator integrated into the single IC chip.

52. (NEW) The radio of claim 39, wherein the signal derived from received high-frequency signals of the plurality of high-frequency signals is a low intermediate frequency signal.

53. (NEW) The radio of claim 39, wherein the circuit path further comprises a low-pass filter for filtering the received data signal output by the discriminator and the low-pass filter is connected to the discriminator and the data output port.

54. (NEW) The radio of claim 39, further comprising the antenna.

55. (NEW) A radio for transmitting and receiving, via an antenna, of a plurality of high-frequency signals in accordance with a frequency-hopping scheme for providing interference immunity on a single IC chip, the radio comprising:

a circuit path adapted to connect the antenna to a data output port and to a data input port, wherein the circuit path comprises:

(1) a bandpass filter for filtering signals derived from received high-frequency signals of the plurality of high-frequency signals;

(2) a discriminator for detecting a received data signal from a received filtered signal, wherein the received data signal is sent to the data output port;

(3) an up-conversion section for up-converting an information signal received from the data input port to a high-frequency signal of the plurality of high frequency signals;

(4) only one variable-controlled oscillator, wherein resonators are implemented for the variable-controlled oscillator without components external to the single IC chip; and

(5) a shaping filter connected to an input of the up-conversion section; and

wherein the frequency hopping scheme is carried out on a plurality of frequencies.

56. (NEW) The radio of claim 55, wherein the frequency-hopping scheme comprises a pseudo-random scheme.

57. (NEW) The radio of claim 55, wherein the plurality of high-frequency signals are modulated using binary Gaussian-shaped frequency-shift keying.

58. (NEW) The radio of claim 55, wherein the variable controlled oscillator is a directly modulated variable controlled oscillator.

59. (NEW) The radio of claim 55, wherein the radio comprises an image-rejection-mixer stage.

60. (NEW) The radio of claim 55, wherein the shaping filter comprises a Gaussian shaping filter.

61. (NEW) The radio of claim 55, further comprising a binary frequency shift keying modulation means.

62. (NEW) The radio of claim 55, further comprising automatic re-transmission request error correction means for data transfer.

63. (NEW) The radio of claim 55, further comprising continuous variable slope delta encoding means for voice transfer.

64. (NEW) The radio of claim 55, wherein the discriminator comprises a frequency modulation discriminator.

65. (NEW) The radio of claim 55, further comprising frequency hopping means for providing interference immunity.

66. (NEW) The radio of claim 55, further comprising:
autotuning means for autotuning a plurality of filters and the discriminator; and
wherein the discriminator comprises an FM discriminator.

67. (NEW) The radio of claim 55 further comprising a digital power-down control circuit to provide power-down control for the radio, wherein the power-down control circuit is integrated into the single IC chip.

68. (NEW) The radio of claim 55, further comprising a low-power oscillator integrated into the single IC chip.

69. (NEW) The radio of claim 55, wherein the signal derived from received high-frequency signals of the plurality of high-frequency signals is a low intermediate frequency signal.

70. (NEW) The radio of claim 55, wherein the circuit path further comprises a low-pass filter for filtering the received data signal output by the discriminator and the low-pass filter is connected to the discriminator and the data output port.

71. (NEW) The radio of claim 55, further comprising the antenna.

72. (NEW) A radio for transmitting and receiving a plurality of high-frequency signals in a time-division-duplex mode, the radio comprising:

an antenna for transmitting and receiving the plurality of high-frequency signals over an air interface;

a circuit path connecting the antenna to a data output port and to a data input port, wherein the circuit path comprises:

(1) a bandpass filter for filtering signals derived from received high-frequency signals of the plurality of high-frequency signals;

(2) a discriminator for detecting a received data signal from a received filtered signal, wherein the received data signal is sent to the data output port;

(3) an up-conversion circuit for up-converting a data signal received from the data input port to a high-frequency signal of the plurality of high-frequency signals; and

(4) a shaping filter connected to an input of the up-conversion section;

wherein the circuit path comprising the bandpass filter, the discriminator, the up-conversion section, the shaping filter, and the data input and output ports is integrated into a single IC chip; and

wherein bandpass filtering operations are performed by components integrated into the single IC chip.

73. (NEW) The radio of claim 72, wherein the circuit path comprises only one variable controlled oscillator integrated into the single IC chip.

74. (NEW) The radio of claim 73, wherein the variable controlled oscillator is a directly modulated variable controlled oscillator.

75. (NEW) The radio of claim 72, wherein the circuit path comprises an image rejection mixer circuit integrated into the single IC chip.

76. (NEW) The radio of claim 72, wherein the shaping filter comprises a Gaussian shaping filter.

77. (NEW) The radio of claim 72, wherein the data information signals are modulated by binary frequency shift keying prior to transmission thereof.

78. (NEW) The radio of claim 72, further comprising automatic re-transmission request error correction means for data transfer.

79. (NEW) The radio of claim 72, wherein the data information signals for voice transfer are encoded using continuous variable slope delta encoding prior to transmission thereof.

80. (NEW) The radio of claim 72, wherein the discriminator comprises a frequency modulation discriminator.

81. (NEW) The radio of claim 72, wherein the radio utilizes a frequency hopping scheme to provide interference immunity.

82. (NEW) The radio of claim 72, wherein the radio utilizes autotuning for a plurality of filters and an FM discriminator.

83. (NEW) The radio of claim 72, wherein the signal derived from received high-frequency signals of the plurality of high-frequency signals is a low intermediate frequency signal.

84. (NEW) The radio of claim 72, wherein the circuit path further comprises a low-pass filter integrated into the singe IC chip for filtering the received data signal output by the discriminator, wherein the low-pass filter is connected to the discriminator and the data output port.

85. (NEW) A radio for transmitting and receiving a plurality of high-frequency signals in a time division duplex mode, comprising:

an antenna for transmitting and receiving the plurality of high-frequency signals over an air interface;

a circuit path connecting the antenna to a data output port and a data input port, wherein the circuit path comprises:

(1) a bandpass filter for filtering signals derived from received high-frequency signals of the plurality of high-frequency signals;

(2) a discriminator for detecting a received data information signal from a received first high frequency signal, wherein the received data information signal is sent to the data output port;

(3) an up-conversion circuit for up-converting a data information signal received from the data input port to a second high frequency signal of the plurality of high frequency signals;

(4) only one variable controlled oscillator; and

(5) a shaping filter connected to an input of the up-conversion section;

wherein the circuit path comprising the bandpass filter, the discriminator, the up-conversion section, the variable controlled oscillator, the shaping filter, and the data input and output ports is integrated into a single IC chip;

wherein the bandpass filter operations are performed by components integrated into the single IC chip; and

wherein resonators are implemented for the oscillator without components external to the single IC chip.

86. (NEW) The radio of claim 85, wherein bond-wire inductance is used to implement the resonators.

87. (NEW) The radio of claim 85, wherein the variable controlled oscillator is a directly modulated variable controlled oscillator.

88. (NEW) The radio of claim 85, wherein the radio comprises an image-rejection-mixer stage.

89. (NEW) The radio of claim 85, wherein the shaping filter comprises a Gaussian shaping filter.

90. (NEW) The radio of claim 85, further comprising a binary frequency shift keying modulation means.

91. (NEW) The radio of claim 85, further comprising automatic re-transmission request error correction means for data transfer.

92. (NEW) The radio of claim 85, further comprising continuous variable slope delta encoding means for voice transfer.

93. (NEW) The radio of claim 85, wherein the discriminator comprises a frequency modulation discriminator.

94. (NEW) The radio of claim 85, further comprising frequency hopping means for providing interference immunity.

95. (NEW) The radio of claim 85, further comprising:
autotuning means for autotuning a plurality of filters and the discriminator; and
wherein the discriminator comprises an FM discriminator.

96. (NEW) The radio of claim 85 further comprising a digital power-down control circuit to provide power-down control for the radio, wherein the power-down control circuit is integrated into the single IC chip.

97. (NEW) The radio of claim 85, further comprising a low-power oscillator integrated into the single IC chip.

98. (NEW) The radio of claim 85, wherein the signal derived from received high-frequency signals of the plurality of high-frequency signals is a low intermediate frequency signal.

99. (NEW) The radio of claim 85, wherein the circuit path further comprises a low-pass filter for filtering the received data signal output by the discriminator and the low-pass filter is connected to the discriminator and the data output port.

100. (NEW) A radio for transmitting and receiving a plurality of high-frequency signals in a time-division-duplex mode, the high-frequency signals transmitted and received in accordance with a frequency hopping scheme for providing interference immunity, comprising:

an antenna for transmitting and receiving the plurality of high-frequency signals over an air interface;

a circuit path connecting the antenna to a data output port and a data input port, wherein the circuit path comprises:

(1) a bandpass filter for filtering signals derived from received high-frequency signals of the plurality of high-frequency signals;

(2) a discriminator for detecting a received data information signal from a received first high-frequency signal, wherein the received data information signal is sent to the data output port;

(3) an up-conversion circuit for up-converting a data information signal received from the data input port to a second high-frequency signal of the plurality of high-frequency signals;

(4) only one variable controlled oscillator; and

(5) a shaping filter connected to an input of the up-conversion section;

wherein the circuit path comprising the bandpass filter, the discriminator, the up-conversion section, the variable controlled oscillator, the shaping filter, and the data input and output ports is integrated into a single IC chip;

wherein the bandpass filter operations are performed by components integrated into the single IC chip;

wherein resonators are implemented for the oscillator without components external to the single IC chip; and

wherein the frequency hopping scheme is carried out on a plurality of frequencies and each of a plurality of time-division-duplex frames occurs at a different hop frequency

101. (NEW) The radio of claim 100, wherein the frequency hopping scheme comprises a pseudo-random scheme.

102. (NEW) The radio of claim 100, wherein the high-frequency signals are modulated using binary Gaussian-shaped frequency shift keying.

103. (NEW) The radio of claim 100, wherein the variable controlled oscillator is a directly modulated variable controlled oscillator.

104. (NEW) The radio of claim 100, wherein the radio comprises an image-rejection-mixer stage.

105. (NEW) The radio of claim 100, wherein the shaping filter comprises a Gaussian shaping filter.

106. (NEW) The radio of claim 100, further comprising a binary frequency shift keying modulation means.

107. (NEW) The radio of claim 100, further comprising automatic re-transmission request error correction means for data transfer.

108. (NEW) The radio of claim 100, further comprising continuous variable slope delta encoding means for voice transfer.

109. (NEW) The radio of claim 100, wherein the discriminator comprises a frequency modulation discriminator.

110. (NEW) The radio of claim 100, further comprising frequency hopping means for providing interference immunity.

111. (NEW) The radio of claim 100, further comprising:
autotuning means for autotuning a plurality of filters and the discriminator; and
wherein the discriminator comprises an FM discriminator.

112. (NEW) The radio of claim 100 further comprising a digital power-down control circuit to provide power-down control for the radio, wherein the power-down control circuit is integrated into the single IC chip.

113. (NEW) The radio of claim 100, further comprising a low-power oscillator integrated into the single IC chip.

114. (NEW) The radio of claim 100, wherein the signal derived from received high-frequency signals of the plurality of high-frequency signals is a low intermediate frequency signal.

115. (NEW) The radio of claim 100, wherein the circuit path further comprises a low-pass filter for filtering the received data signal output by the discriminator and the low-pass filter is connected to the discriminator and the data output port.

116. (NEW) A method for communication of at least one data signal, wherein all of the steps for the method of communication are performed on a single IC chip, the method comprising the steps of:

receiving a first high-frequency information signal transmitted over an RF link in a time-division-duplex mode;

converting the received first high-frequency information signal into a low-intermediate-frequency signal using a single variable controlled oscillator;

filtering the low-intermediate-frequency signal using a bandpass filter;

detecting a received data signal using a discriminator;

sending the detected received data signal from the discriminator to a data output port;

sending, from a data input port to a shaping filter, a data signal to be transmitted over an RF link;

shape filtering the to-be-transmitted data signal;

converting the shape-filtered to-be-transmitted data signal to a second high-frequency information signal using the single variable controlled oscillator, and

transmitting the second high-frequency information signal over the RF link.

117. (NEW) The method of claim 116, wherein the low-intermediate-frequency signal is centered at about 3 MHz.

118. (NEW) The method of claim 116, wherein converting the received first high-frequency information signal uses an image-rejection-mixer circuit.

119. (NEW) The method of claim 116, wherein the shape filtering step uses a Gaussian shaping filter.

120. (NEW) The method of claim 116, wherein the radio uses binary-frequency-shift-keying modulation for transmitting the information signal over the RF link.

121. (NEW) The method of claim 116, further comprising the step of encoding the to-be-transmitted data over the RF link using continuous-variable-slope-delta-encoding techniques.

122. (NEW) The method of claim 116, wherein the discriminator comprises a frequency modulation discriminator.

123. (NEW) The radio of claim 122, wherein the frequency modulation discriminator uses frequency shift keying.

124. (NEW) The method of claim 116, further comprising the step of immunizing the received first high-frequency information signal and the transmitted second high-frequency information signal from interference by using a frequency-hopping scheme.

125. (NEW) The method of claim 123, wherein the frequency-hopping scheme comprises a pseudo-random scheme.

126. (NEW) The method of claim 116, wherein resonators are implemented for the single variable controlled oscillator without components external to the single IC chip.